The use of outcome measures in equine rehabilitation

Gillian Tabor and Jane Williams
Equestrian Performance Research Arena, University Centre, Hartpury, Gloucester, GL19 3BE

Gillian Tabor, ResM, MSc, MCSP, ACPAT A, RAMP: Programme Manager MSc Veterinary Physiotherapy, University Centre, Hartpury

Jane Williams D.Phil MSc VN: Head of Department HE Animal and Agriculture, University Centre, Hartpury

Correspondence to: Gillian Tabor, University Centre, Hartpury, Gloucester, GL19 3BE, 01452 702261, Gillian.tabor@hartpury.ac.uk

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Introduction

The ideal goal of equine rehabilitation following injury or surgery is to return the horse to a level of function that either meets or exceeds the previous performance level. Musculoskeletal rehabilitation programmes may include combination of interventions such as thermal therapy, electrotherapy, exercise therapy and manual therapies (Buchner and Schildboeck, 2006). Monitoring progress of the patient is important within rehabilitation and this should be achieved using methods that are able to reliably judge the change in the horse from the initial assessment and onward through the course of treatment. A test used to objectively determine if there has been meaningful change in health status during a course of treatment is known as an outcome measure (OM) (Hefford et al, 2011). Using standardised and validated OMs in clinical practice is an explicit requirement of human physiotherapy practice (Chartered Society of Physiotherapy, 2017) and the government's NHS white paper 'Equity and Excellence; Liberating the NHS' (Dept of Health, 2010) recommends the use of outcome measures be used wherever practical. It is unknown if practitioners, including Chartered Physiotherapists working with animals, and more specifically horses, use OMs within practice.

There has been critique of studies investigating the efficacy of animal rehabilitation / physiotherapy inventions based on their poor methodologies but also due to the lack of appropriate OMs used to

assess progress or success (Buchner and Schildboeck, 2006). Adopting good practice from contemporary musculoskeletal injury management in human medicine has the potential to improve reporting of the effects of rehabilitation in the horse and strengthen the evidence base used to support physiotherapy and rehabilitation in practice.

Traditionally physiotherapists use measures and tests of impairments such as pain, range of motion, and muscle strength to measure patients progress (Abrams et al. 2006). Recently a scale for assessing mild to moderate pain in stabled horses (Gleerup et al. 2015) and an ethogram to evaluate pain in ridden horses have been validated (Dyson et al. 2018) with both accurately highlighting specific facial expressions demonstrated in the presence of pain. Measurement of range of motion using a goniometer has high inter and intra-rater repeatablility when assessing joint angles in the knee, hocks and fetlocks in the standing horse (Liljebrink and Bergh, 2010; Adair et al. 2016). Strength, measured a voluntary maximal voluntary contraction in humans, cannot be tested in horses but muscle size, as a proxy for strength, could be a useful measure of change in muscle function (Stubbs et al, 2011). Symmetry of the muscles in the back can be recorded with a flexible curve ruler (Greve and Dyson, 2014) and ultrasound imaging has been used to measure the cross sectional area of the spinal stabiliser muscle multifidus (Stubbs et al. 2011; Tabor, 2015). Whilst use of these measures has been reported in the literature, uptake by the clinician has yet to be reported and it is unknown if the tools used in research are in fact viable and practical within equine rehabilitation.

The OMs used extensively in human practice and in research are forms of patient reported outcomes (PRO). PROs generally consist of a series of questions and observation of functional tasks, and target the patient to be able to establish a repeatable and consistent appraisal of progress. Commonly used PROs are the Victorian Institute of Sport Assessment (VISA) scales and The Copenhagen Hip and Groin Outcome Score (HAGOS). The VISA-P, which is a tool used for measuring severity of patella tendinosis and the VISA-A, measuring achilles tendinopathy. The reliability of these tools has been extensively validated with 267 and 355 citations respectively of their reliability studies within human studies (Visentini et al. 1998; Robinson et al. 2001). The HAGOS is another example of a successful PRO is which was generated and tested to also score pain, symptoms and physical function (Thorborg et al. 2011). PROs are reported to serve as a gold standard in assessment of musculoskeletal conditions. Obviously, in human rehabilitation, practitioners have the advantage that their patients can articulate how they are feeling and can be questioned to fully assess their progress. The use of OMs in equine rehabilitation practice has the potential to contribute to the future development of adapted PRO where owners and riders act as proxy voices for their horses.

Therefore the aim of this study was to evaluate the knowledge of, and use, of OMs in equine musculoskeletal rehabilitation, to identify OMs used and clinician opinion regarding OM use in practice

Methods

A questionnaire was used to investigate how physiotherapists involved with the treatment and training of horses measure progress and outcomes during rehabilitation. Snowball sampling was used to collect data via a link to a Survey Monkey™ (www.surveymonkey.com) form that was shared via social media on animal and veterinary physiotherapy pages. The questionnaire contained five questions collecting demographic data including respondent qualification and duration of experience within equine rehabilitation. The respondent was asked to define an OM, which was scored against the criteria for treatment plan evaluation within the quality assurance standards of the CSP (CSP, 2017) whether it was correct, partially correct, wrong or there was no answer. The next set of questions pertained to the use, selection and frequency of OMs use as well as how the OM data were subsequently analysed. A Chi-squared test, with significant value of 0.05, was used to determine an association between physiotherapy training and use of OM. If the response was that no OMs were used, the respondent was directed to a question asking their reasons for not using OM. The final section requested opinions on the benefits and barriers to OM use in equine rehabilitation and further comments.

Results

71 physiotherapists responded, comprising of veterinary physiotherapists with prior human training ie Chartered Physiotherapists, (n=51) and those with no prior human qualification (n=20), from six countries, with an average of 9.25 years in equine practice. When asked to define an OM, 72.5% of Chartered Physiotherapists correctly/partially correctly matched the CSP criteria and 7.8% were incorrect. Of the Veterinary Physiotherapists, without prior human physiotherapy training, 40.0% were correct/partially correct with 15.0% being incorrect in their definition of an outcome measure.

The majority of respondents reported using OMs although the use of OMs varied across the two groups with 93.0% (n=40) of Chartered Physiotherapists and 71.4% (n=14) of veterinary physiotherapists reporting they used OMs. A significant association between prior human physiotherapy training and use of OM was observed $\chi^2_{(1)} = 4.5719$, $p = 0.0325$.

Reasons for not using OMs were cited as being due to time constraints, an inability to measure pain, no real need to measure them and that OM use was not taught when studying. However six

professionals who reported that they did not use OMs stated this was because there were no validated measures available to use.

The OMs in use were listed in frequency order as range of motion (ROM) (22.0%), gait (11.3%) palpation (10.7%), muscle bulk assessment (10.0%), owner reported outcomes/function (6.7%), lameness (6.0%), symmetry (2.7%), posture (2.7%), stability assessment (2.0%), pain (2.0%) and motion palpation (0.06%)

The responses to the open questions regarding perceived benefits and barriers to OM use were collated in themes and are reported in table 1.

[Table 1]:

Discussion

In support of the standard use of OMs, a high percentage of physiotherapists involved in equine rehabilitation state using OMs during their practice. However within this narrative, there are reports of high frequency selection of measures that are less than objective in nature. The top three OMs respondents reported using, ROM, gait assessment and palpation, could all be valid, objective and repeatable OMs. However the use of a goniometer to measure ROM occurred in less than 25% of respondents. Assessment of gait, although noted to be recorded on video by some, was described as being an objective method of collecting data. Gait assessment by veterinarians is reported to have low repeatability, especially for mild lameness (Keegan et al. 2010), which is likely to be the level of lameness presented in horses undergoing rehabilitation. Gait assessment cannot truly be reported as objective unless kinematic assessment is used to collect data, such a 2D or 3D motion capture, or, as an example, inertial motion sensors are used to document motion asymmetries (Clayton and Schamhardt, 2013; Pfau et al. 2016) Palpation could be used as an OM if the practitioner follows a validated, objective method such as the palpation scoring system for equine muscle (Varcoe-Cocks et al. 2006) however this system was not cited as a tool used and it has to be assumed that each therapist may be using their own scoring system. Therefore although many respondents believe they are using objective OMs, without the use of validated tools and methodologies, many of the OMs are being applied in a subjective and unreliable manner.

To assess understanding of OMs, the definition of an OM was requested although this was left blank by a number of those who went on to complete other portions of the survey. This was presumed to be due to either, reluctance to use the time it would take to write out an answer or lack of knowledge of the answer. Whilst the majority who responded correctly or partially correctly defined an OM, there were a large number of incorrect answers. Many of these contained reference to subjective

measures based around a single point such as goal setting or outcome after six months of treatment. An answer was marked as correct if the definition included gaining objective baseline data and that same instrument can be used to determine progress and treatment efficacy during or at completion of treatment. There appeared to be a lack of knowledge surrounding OM suggesting that physiotherapists working within this area may consider that they are using OM. If the practitioner working with animals is a Chartered Physiotherapist in animal practice, they may not be compliant with their professional body's requirement for OM use. The standards of practice for veterinary physiotherapist who are members of associations other than the Chartered Society of Physiotherapy are not available to view publically, so it is unclear if the use of OM is a requirement. The reported use of OM depended on the training the physiotherapist had received however, more Chartered Physiotherapists reportied to use OM that physiotherapists that have not have prior human physiotherapy training. The statement that the professional was not using OM by six respondents was justified by the lack of available, validated and reliable OM. Similar comments were seen in the list of barriers to OM use, as presented in table 1.

Based on this information from a small group of professionals it would appear that there are limiting factors to the use of OMs in equine rehabilitation. This is primarily a lack of available OMs specific for equine rehabilitation. If the VISA-P, VISA-A and HAGOS (Visentini et al., 1998; Robinson et al., 2001; Thorborg et al., 2011) were adapted for equine practice they would be a trainer or rider reported outcome. The challenge within equine practice, would be to identify categories of function or perceived pain that would be valid to report in the third party i.e. the horse. Consideration to the knowledge and understanding of the owner / trainer / rider as well as their judgement and emotion surrounding the expectation of the rehabilitation would also have to be taken into account to limit false reporting of progress.

From the final comments provided by those working with horses during rehabilitation, OM specific to this area of therapy are wanted. Therefore it would be worthwhile investing in the development of a system that ensures that the progress of treatment can be objectively recorded. In terms of evidence based medicine this will create a clinical log of the effectiveness of treatments supporting the clinical reasoning of therapists and the on-going requirement for evidence based treatment approaches.

Conclusion

The benefits of OM use were reported consistently as a method of objectively monitoring progress and used to adapt treatment plans which is in accordance with the definition of OM and therefore the

use of them as required within professional guideline. However, confusion exists regarding what an OM is and OM use is reported but often refers to subjective assessment method. More work is needed to develop practically applicable outcome measures for specific professionals who are involved in the rehabilitation of equines.

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